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## GUIDANCE FOR ESTIMATING CONSUMABLE AND DEPOT LEVEL REPARABLES COST

**PURPOSE:** The purpose of this paper is to provide guidance for including surcharges and credits in cost estimating for Depot Level Reparables and Consumables in Baseline Cost Estimates (BCE), Independent Cost Estimates (ICE), and other cost estimating products.

**SUMMARY:** Two critical components of the U.S. Army Cost and Economic Analysis Center's (USACEAC) mission are to develop and disseminate cost and economic policy; and to provide timely/quality cost and economic analysis support to the Planning, Programming, Budgeting, and Execution System (PPBES) and the Army Staff decision making process.

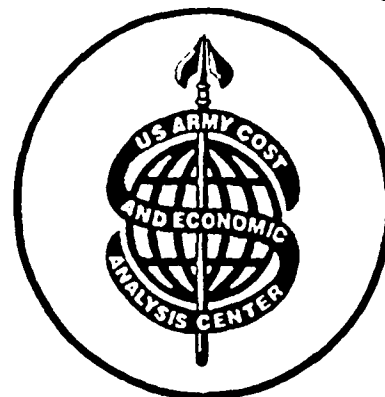
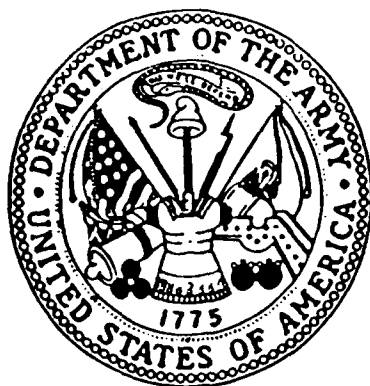
New cost estimating procedures are required because of two important DMRD changes: the inclusion of surcharges in Army Master Data File (AMDF) prices and the change from procurement funding to operations and maintenance funding for Replenishment DLRs under the Supply Management, Army (SMA), formerly Army Stock Fund (ASF).

Specifically, DMRD 904 "Stock Funding of Reparables" affected the cost element structure and the definition of costs components used in Army resource management, particularly in the management of operating and support costs. Under this concept, units no longer receive replacement DLRs as free issue. Therefore, cost analysts must account for surcharges and credits when developing a system's life cycle costs.

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CONSUMABLE AND  
DEPOT LEVEL REPARABLES COST**

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## **GUIDANCE FOR ESTIMATING CONSUMABLE AND DEPOT LEVEL REPARABLES COST**

**PURPOSE:** Recent Defense Management Review Decisions (DMRDs) have necessitated a change to cost estimating procedures for Consumables and Depot Level Reparables (DLR). The purpose of this paper is to provide guidance for including surcharges and credits in cost estimating for Depot Level Reparables and Consumables in Baseline Cost Estimates (BCE), Independent Cost Estimates (ICE), and other cost estimating products.

**SUMMARY:** Two critical components of the U.S. Army Cost and Economic Analysis Center's (USACEAC) mission are to develop and disseminate cost and economic policy; and to provide timely/quality cost and economic analysis support to the Planning, Programming, Budgeting, and Execution System (PPBES) and the Army Staff decision making process.

New cost estimating procedures are required because of two important DMRD changes: the inclusion of surcharges in Army Master Data File (AMDF) prices and the change from procurement funding to operations and maintenance funding for Replenishment DLRs under the Supply Management, Army (SMA), formerly Army Stock Fund (ASF). Both changes became effective in FY 92 and fall under the umbrella concept of the Defense Business Operating Fund (DBOF).

Specifically, DMRD 904 "Stock Funding of Reparables" affected the cost element structure and the definition of costs components used in Army resource management, particularly in the management of operating and support costs. Under this concept, units no longer receive replacement DLRs as free issue. Therefore, cost analysts must account for surcharges and credits when developing a system's life cycle costs. This presentation addresses the modified procedures used to cost materiel systems that were provided in the memorandum.

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**GUIDANCE FOR INCLUDING SURCHARGES AND CREDITS  
IN COST ESTIMATES FOR DEPOT LEVEL REPARABLES AND CONSUMABLES**

**1. References:**

- a. Cost Analysis Manual, August 1992, USACEAC.
- b. Memorandum, OASA (FM), 28 May 1991, subject: Policy/Guidance for Cost Estimating Changes.
- c. DCA-P-92(R), 15 May 1984, subject: Instruction for Reformatting the BCE/ICE.

**2. Definitions:** A glossary of terms and pertinent definitions are at Attachment A.

**3. Purpose:** To provide background and procedures for estimating the cost of a Depot Level Repairable (DLR) and Consumable in Baseline Cost Estimates (BCE), Independent Cost Estimates (ICE), and other cost estimating products. [Note: This guidance also applies to the most recent cost estimating products described in the new DODD 5000.4-M, including the Program Office Estimate (POE) and the Component Cost Analysis (CCA).]

**4. Background:**

a. The recent downward trend in dollar resources available for defense precipitated a change in the way the Army manages its resources. Supply and maintenance alone consumes 10 percent of the Army's resources. In order to more efficiently utilize these resources, a basic two pronged approach was implemented: reduce unit demands to only those things that cannot be fixed, and reduce the total cost of providing unit supplies by improving the efficiency in the delivery of supplies.

b. Stock funding of DLRs affords the Army the benefit of improved secondary item inventory management and financial management. Instead of having one appropriated fund for procurement and another for repair, the Supply Management, Army (SMA), formerly the Army Stock Fund (ASF), funds both. The accounting and reporting functions for the ASF is decentralized and performed at the branch office/MSC level.

c. Several key policy decisions changed the way cost estimating for DLR (Spares) and Consumables (Repairs) is done. There were changes in terminology, stock fund procedures, and surcharge and credit policy.

(1) Terminology. Beginning in FY 92, all secondary items were realigned into two categories: reparable (a.k.a. DLRs, SFDLRs) and consumables. Repairables are somewhat similar to the former spares, and consumables are somewhat similar to the former repair parts. This terminology assists in differentiating between pre- and post-SFDLR implementation data. The terms DLR and consumable are from the wholesaler's perspective, where a DLR is a part which must be returned to the depot (wholesale supply system) for repair. However, many parts can be repaired at the retail level, such as a Direct Support Unit, and still be classified as a reparable. The Army Master Data File (AMDF) contains these data, along with the price, for each item. See Glossary for more detailed description of spares, repairs, reparable, consumable, and AMDF. Attachment B displays the changes to the relevant cost elements used in the development of BCE/ICES as a result of SFDLR (DMRD 904) implementation.

(2) Stock Fund. Defense Management Review Decision (DMRD) 904, "Stock Funding of Repairables," affected the cost element structure and definitions of cost components used in Army cost estimating. Under the Stock Funding of Depot Level Repairables (SFDLR) concept, replenishment DLRs (5.03) are no longer procurement funded. Rather, they are purchased from producers by the Supply Management, Army (SMA) (formerly called Army Stock Fund) portion of the Defense Business Operating Fund (DBOF) and sold to the unit. The unit now pays for them with OMA dollars rather than receiving them "free issue" as in the past. Initial DLRs (2.101) are purchased by the DBOF which is reimbursed by appropriated dollars when issued to the PEOs/PMs (initial issue is reimbursed by procurement authority).

(3) Surcharge. DMRD 901, "Reducing Supply System Costs," directs that all costs for, or directly related to, stock-funded items be included in the price paid by customers. A surcharge is included in the price of the consumables and repairables (DLRs) to cover personnel, transportation, repair, storage, and associated costs. Beginning in FY 92, the published Army Master Data File (AMDF) prices included the applicable surcharge. This surcharge is different from the previous surcharge (pre-FY 92) which did not cover personnel or all transportation costs. Army units are funded based on AMDF prices, therefore they are funded for the surcharge. MSC-specific surcharges are provided at Attachment C.

(4) Credit. DMRD 901 also resulted in a credit, or percentage of the item price, being given to the customer for each DLR turned in to the supply system. Beginning in FY 92, DA, ODCSLOG provided Major Subordinate Command (MSC)-specific credit rates for DLRs. These are composite rates derived from rebuild cost and washout rates and are provided at Attachment C. Army units are funded using these rates. However, credit rates for consumables are not applicable to costing because any turn-in of a consumable is usually the result of an ordering adjustment and thus is not tied to usage of the equipment.

## 5. Procedures:

a. Cost estimating for Consumables and DLRs involve three steps: establishing item price, making adjustments to the price (i.e. surcharges and credits), and developing operating costs for the item. The following methodology assumes that an AMDF price is available. See paragraph 5.d when AMDF prices are not available, then follow the methodology below.

b. The application of surcharges and credits affects the cost estimate of initial DLR, initial consumables, replenishment DLR, replenishment consumables, and war reserves. Below are the corresponding cost elements shown in Appendix E of the USACEAC Cost Analysis Manual along with a description of how to do the cost estimate for each. For the formulas below, MSC = MSC specific credit rate, Q = Quantity, and P = AMDF or AMDF-equivalent price.

(1) Initial DLR (Procurement 2.101): DLRs are costed using the most recently published AMDF price (standard price), which includes a surcharge, and is adjusted for inflation. If the DLR is a new item, the manufacturer's production price is used. Credits should not be considered when costing initial DLRs since they are purchased by the Program Manager and issued free with the end item. When the initial DLR becomes unserviceable, the credit for its turn-in will be applied to the replenishment DLR. Initial DLRs should be costed using Procurement Appropriation funding in the year of fielding.

(2) Initial Consumable (Procurement 2.102): Consumables are costed using the most recently published AMDF price (standard price), which includes a surcharge, and is adjusted for inflation. If the consumable is a new item, the manufacturer's production price is used. Credits should not be considered when costing initial consumables since they are purchased by the Program Manager and issued free with the end item. Initial consumables should be costed using Procurement Appropriation funding in the year of fielding.

(3) Replenishment DLR (OMA 5.03): DLRs are costed using the most recently published AMDF price (standard price), which includes a surcharge, and is adjusted for inflation. Credits must be considered, since the assumption is that there will be turn-ins of unserviceable DLRs. The MSC-specific credit rate is a percentage specific to each fiscal year.

(a) The equation for costing a specific item is:

$$\text{Cost} = (1 - (\text{MSC}/100)) \times P$$

This approximates the item's net cost from the Army wholesaler. Replenishment DLRs should be costed using OMA funding in the year of operation. Therefore, it is important to determine the first year of "replenishment" after the fielding of a new system.

(b) The ODCSLOG Return Rate must also be considered when estimating Replenishment DLRs. The ODCSLOG Return Rate goal is for 90% of all DLRs to return to the system. The 10% of DLRs that do not make it back to the system must be fully costed (10% of projected total demand times the AMDF price) since the commodity manager will have to purchase replacements from the manufacturer. The remaining 90% of the projected total demand should be costed using the MSC-specific credit rate. The equation for costing the total demand is:

$$\text{Cost} = (.10 \times Q \times P) + (.90 \times Q \times P[1 - (\text{MSC}/100)]).$$

(4) Replenishment Consumable (OMA 5.04): Consumables are costed using the most recently published AMDF price (standard price), which includes a surcharge, and is adjusted for inflation. Credits need not be considered for costing purposes since the assumption is made that there will be no turn-in of consumables; units will consume what they order. Replenishment Consumables should be costed using OMA funding in the year of operation. Therefore, it is important to determine the first year of "replenishment" after the fielding of a new system.

(5) War Reserves (DBOF 6.01): War Reserves are costed using the most recently published AMDF price, which includes a surcharge and is adjusted for inflation. Credits need not be considered, since the assumption is no turn-in of war reserves. War Reserves should be costed using DBOF Budget Authority.

c. Operating costs are usually expressed in terms of dollars per hour or per mile basis multiplied by the system density. Established cost factors may be used as a starting point to estimate operating costs. Operating costs must be spread over the useful life of the system.

d. When AMDF prices are not available, an AMDF-equivalent price must be developed.

(1) This can be done by using a Cost Estimating Relationship (CER) to estimate the AMDF-equivalent price. Use of a CER requires review of the relevant historical data. Valid relationships between cost and definable physical attributes or operational characteristics must be set up in order to establish a base price.

(2) Adjustment(s) for the inclusion and exclusion of surcharges and credits must then be made. If data prior to FY 92 or acquisition costs (cost to acquire item from the manufacturer) are used, the appropriate base surcharge must be added regardless of whether the item is a consumable or reparable (DLR).



(3) If the item is a DLR, a distinction must be made between initial and replenishment DLRs. Only replenishment DLRs need to be adjusted using the MSC-specific credit rates, as described in Paragraph 5a above. Therefore, it is important to determine the first year of "replenishment" after the fielding of a new system.

(4) As a final step, the proper inflation factors must always be applied to develop the AMDF equivalent price. New inflation guidance is distributed annually from OSD.

## ATTACHMENT A

### GLOSSARY/DEFINITIONS

o Army Master Data File (AMDF): An automated data system maintained by the Army Materiel Command (AMC) used to record supply management information for the Army. It contains many different fields and codes to describe an item (e.g. unit weight and price, units of measure and issue, supply class and repair codes). A combination of these codes determines the separation of Class IX into consumable and reparable categories. The Maintenance Repair Code (MRC) and the Automatic Return Item (ARI) code together indicate whether a part is to be repaired when unserviceable, instructions for component return and the lowest level of maintenance authorized to perform the repair (e.g. wholesale level, Depot; or retail level, Direct Support Unit). The Materiel Category (MATCAT) code is used to identify which MSC manages the part.

o AMDF Price: The AMDF is the most recently approved price for an item in the inventory with a unique NSN. The AMDF price will show the latest known representative procurement cost plus authorized surcharges. The AMDF price is set once a year by the Item Manager at the appropriate MSC. AMDF prices are then approved by OSD and HQDA and fixed for each fiscal year. The only way a price can change during the year is if there is a greater than 20% change in price of an item as documented by a recent procurement. A thorough investigation is then conducted before the price change is entered in the AMDF. AMDF prices are expressed in the current fiscal year dollars.

o Army Stock Fund (ASF): A revolving capital fund designed to finance the supply pipelines between the user and the vendor. It is now called Supply Management, Army (SMA) and it is part of the Defense Business Operating Fund (DBOF). The SMA will finance the peacetime operating stock requirements for both consumable and reparable secondary items. It will also fund the wholesale (depot level) and retail (general support level) maintenance requirements for DBOF owned reparable items.

o Class IX Supply Category: This category identifies items which are repair parts. This includes kits, assemblies, and subassemblies, used in the repair of end items. It includes any item, reparable or nonreparable, which is needed to provide maintenance support to any equipment.

o Consumable: Defined by AMDF field attributes. Specifically, consumables are those parts with MRC = 'F', 'H', or 'O' and an ARI not equal to 'C', 'E', 'R', 'S', or MRC equal to 'Z', 'B', 'G', '-' and Blank. (By default, they are parts that are not reparable/DLRs.) Generally, any part, assembly, subassembly or component consumed in the operation, maintenance, and support of a primary system and associated support equipment at the unit level. Typically, a consumable is consumed in use and has no salvage or rebuild value. Excludes critical items stocked at General Support, Direct Support or Unit level.

o Credit: Percentage of the standard price (AMDF price) refunded to the customer for the turn-in of unserviceable reparable items to the depot system for repair. For reparable, it is developed using rebuild cost and washout rates. The reparable credits vary among the different Commodity Commands of the Army Materiel Command.

o Defense Business Operating Fund (DBOF): Revolving Fund established under DMRD 971 in FY 92 with the goal of balancing total revenues with total net operating costs. All existing industrial and stock funded activities were encompassed in DBOF, which operates like a commercial business. It purchases supplies from vendors with stock funds and sells those supplies to customers, and then uses the proceeds from those sales to buy more supplies and pay operating costs.

o DBOF Business Area: An activity financed under DBOF. Criteria for inclusion in the DBOF as a Business Area are: outputs can be identified, costs can be related to outputs, and customers can be identified. There are currently three Army business areas in DBOF, including Supply Management which covers secondary items.

o Depot Level Reparables: Defined by AMDF attributes. Reparables are defined as secondary items with a MRC = 'D', 'L', or field level reparable items with MRC = 'F', 'H', or 'O', and an ARI code of 'C', 'E', 'R', or 'S'. Generally, any part, assembly, subassembly or component required on a recurring basis for the repair of major end items of equipment subsequent to fielding. A DLR is a secondary item reparable that can be completely repaired only at the depot level or special repair activity (SRA). Includes critical items at General Support, Direct Support or Unit Level. Typically, DLRs are returned to the supply system for repair/rebuild when broken. Prior to 1 Oct 90, DLRs were purchased using Procurement Appropriation, Army Secondary (PAA-2) funds and issued free to Army customers. As of 1 Apr 92, Army customers reimburse the SMA for these items.

o Rebuild Cost: The cost required to restore an item to its previous normal operating condition.

o Return Rate: The rate at which reparable secondary items are sent back to the depot for repair.

o Repairs/Repair Parts: Parts definition based on AMDF attributes. An obsolete term that can be very loosely tied to the current "consumable" term. Units purchased these items, but received no credit for turn-in. Typically, these parts were consumed in usage.

o Reparable: Defined by AMDF attributes. Any part, assembly, subassembly or component required for installation in the maintenance or repair of an end item, subassembly or component, subsequent to fielding, at a depot or special repair activity (SRA). Includes critical items at general support, direct support or unit level maintenance levels.

o Revolving Fund: A working capital fund whose basic structure serves two purposes: first, to capitalize the costs of producing goods or providing services, and second, to buy and hold inventories until the customer or user pays for them. Market demand sets the level of operation. However, over the long run, revolving funds must break even. This causes prices, as well as the corresponding surcharges, to fluctuate from year to year.

o Secondary Item: A reparable or consumable item under the SFDLR Plan that is included in the stock fund account. Secondary items are centrally managed by Army Inventory Control Points (ICP).

o Spares: Parts definition based on AMDF attributes. An obsolete term that can be very loosely tied to the current "reparable" term. Units used to receive these items as free issue. Typically, these parts had salvage or rebuild value, but there was no credit for turn-in.

o Stock Funded Depot Level Reparable (SFDLR): Another term for Depot Level Reparable (DLR). (See definition above.)

o Supply Management, Army (SMA): A DBOF business activity (formerly Army Stock Fund) that sells secondary items (consumables and reparables).

o Surcharge: Percentage included in the formula prescribed for computing the standard price for an item to cover estimated transportation costs, inventory maintenance, foreseeable net losses, price stabilization, and other expenses relating to such items, as authorized.

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o Unit Level Maintenance: Unit maintenance is performed at the battalion level and by mobile teams operating from the battalion level that support operational units. Unit level maintenance operations normally include preventive maintenance checks and service inspections, lubrication, cleaning, preserving, tightening, replacing, minor adjustments, diagnosing, fault isolating, replacing unserviceable consumable parts authorized by the Source, Maintenance, and Recoverability (SMR) code, and verifying faults and levels of repair.

o War Reserve: Stocks that are routinely maintained at levels necessary to support wartime operations. War Reserve stocks will be funded through a separate congressional appropriation to DBOF.

o Washout Rate: The engineering estimate based on historical data of the percentage of parts that, after failure, will be determined to be beyond economical repair.

o Wholesale Pipeline: The processing and moving of both serviceable and unserviceable secondary items (DLR) through the supply system. This includes transportation and transaction costs, as well as the cost of the item. Since these costs are reflected in the surcharge to the standard AMDF price, it is no longer necessary to separately cost the wholesale pipeline in weapon system cost estimates. The wholesale pipeline for both DLRs and consumables for a weapon system is initially purchased by the SMA business area of DBOF. It is no longer purchased with appropriated dollars. During the life of the system, the SMA sells parts to units, repairs DLRs and buys new parts from suppliers, always maintaining a "pipeline" of parts in stock or on order. At the end of system life, that pipeline will be sold and not replaced. Since customers now purchase DLRs until disposal of the system, replenishment DLR costs should be shown for all years since the cost of doing business (i.e. maintaining the wholesale pipeline) is funded by the surcharge to the standard price.

# ATTACHMENT B

## DMRD 904 IMPACT ON COST ELEMENT STRUCTURE

OLD COST ELEMENT	NEW COST ELEMENT
2.0 Production	2.0 Procurement Funded Elements*
2.07 Initial Spares	2.10 Fielding
	2.101 Initial DLRs (Spares)
	2.102 Initial Consumables (Repair Parts)
4.0 Fielding	
4.04 Initial Repair Parts	
5.0 Sustainment	5.0 Operations and Maintenance (OMA) Funded Elements
5.011 Replenishment Repair Parts	5.03 Replenishment DLRs**
5.012 Replenishment Spares	5.04 Replenishment Consumables
5.013 War Reserve Repair Parts***	
5.014 War Reserve Spares***	
	6.0 DBOF***
	6.01 Class IX War Reserve

### NOTE:

\* Initial Spares & Repair Parts no longer include wholesale pipeline costs.

\*\* Replenishment DLR (Spares) changed from Procurement to OMA funding.

\*\*\* DBOF/ASF will buy War Reserve Consumables and DLRs.

# ATTACHMENT C

**Table 1**  
**BASE SURCHARGE (%)**  
**EMBEDDED IN AMDF PRICE**

COMMAND	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
AMCCOM	22.3	22.3	19.6	18.6	18.6	18.6
AVSCOM*	24.4	19.3	16.7	17.4	17.4	17.4
CECOM	20.7	20.0	17.3	18.4	18.4	18.4
MICOM	23.1	20.0	17.4	18.6	18.6	18.6
TACOM	23.6	19.5	17.0	17.7	17.7	17.7
TROSCOM*	24.4	19.3	16.7	17.4	17.4	17.4
COMPOSITE	23.6	19.7	17.2	17.9	17.9	17.9

\* NOTE: AVSCOM/TROSCOM were combined to form ATCOM as of FY 93.  
SOURCE: ODCSLOG, (DALO-RMI), 14 April 1993

**Table 2**  
**MSC-SPECIFIC CREDIT RATES (%)**

COMMAND	FY 93	FY 94	FY 95	FY 96	FY 97
AMCCOM	59.9	51.6	51.6	53.7	53.7
AVSCOM*	59.1	54.7	54.0	56.1	56.1
CECOM	53.0	49.0	48.5	50.2	50.2
MICOM	64.2	59.4	57.0	59.9	59.9
TACOM	55.6	51.1	52.1	54.1	54.1
TROSCOM*	56.4	52.2	53.1	55.0	55.0

\* NOTE: AVSCOM/TROSCOM were combined to form ATCOM as of FY 93.  
[AVSCOM = AVIATION; TROSCOM = TROOP SUPPORT]

SOURCE: ODCSLOG Memorandum dated 4 Dec 1992 for the FY 93 rates  
ODCSLOG Memorandum dated 27 Jan 1993 for FY 94-97 rates